

Claims:

1. A transformed cell or organism having reduced activity of at least one protein wherein

a. a nucleic acid sequence of a gene encoding said protein is a recombinant sequence which is reduced by at least one nucleotide base as compared to a wild-type gene encoding said protein;

b. the activity of said protein is reduced by the presence of anti-sense nucleic acid sequence;

c. the nucleic acid sequence of the gene encoding said protein is a recombinant sequence having at least one point mutation as compared to the wild-type gene encoding said protein;

d. the nucleic acid sequence of the gene encoding said protein is a recombinant sequence which is shuffled as compared to the wild-type gene encoding said protein; or

e. the nucleic acid sequence of the wild-type gene encoding said protein is a recombinant sequence which is increased by at least one nucleotide base as compared to the wild-type gene encoding said protein;

and wherein the nucleic acid sequence of said wild-type gene encodes a peptide having at least 65 percent similarity with an amino acid sequence selected from the group consisting of SEQ ID NOs: 3 and 44 through 69.

2. A transformed cell or organism according to claim 1 wherein the transformed cell or organism is a recombinant *Xanthomonas campestris* bacteria.

3. Recombinant *Xanthomonas campestris* bacteria of claim 2 wherein the function of said protein is reduced to a level not more than about 0.1 percent of protein activity in said wild-type strain.

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4. Recombinant *Xanthomonas campestris* bacteria of claim 3 wherein said wild-type strain is NRRL-B 1459.

5. Recombinant *Xanthomonas campestris* bacteria of claim 2 wherein the number of nucleotide bases in said gene is reduced or increased by two or more as compared to said wild-type gene.

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6. Recombinant *Xanthomonas campestris* bacteria of claim 5 wherein said gene encodes a galactomannanase.

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7. Recombinant *Xanthomonas campestris* bacteria of claim 6 wherein at least substantially all of said gene is deleted.

8. Recombinant *Xanthomonas campestris* bacteria of claim 7 wherein said bacteria is strain GMAN.

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9. A DNA construct useful for generating a cell or organism according to claim 1 comprising at least one of (a) modified sequence of a wild-type gene and (b) flanking sequence of said wild-type gene.

5 10. A DNA construct of claim 9 comprising a vehicle for homologous recombination comprising flanking sequence from both sides of said gene.

10 11. A DNA construct according to claim 10 wherein said flanking sequence comprises at least about 30 base pairs of flanking sequence from each side of said gene.

12. A DNA construct of claim 11 wherein said flanking sequence comprises at least about 30 base pairs of SEQ ID NO: 4 and SEQ ID NO: 5.

15 13. A DNA construct of claim 11 wherein said flanking sequence comprises SEQ ID NO: 6 and SEQ ID NO: 7.

20 14. A DNA construct according to claim 9 wherein said modified sequence of a wild-type gene comprises an exogenous nucleic acid sequence flanked by sequence from said gene .

15. A transformed cell or organism having enhanced activity or function of at least one protein wherein

- a. said cell or organism comprises multiple recombinant copies of a nucleic acid sequence of a gene encoding said protein;
- b. said cell or organism comprises recombinant regulatory sequence operably linked to the gene encoding said protein, or
- 5 c. the nucleic acid sequence of the gene encoding said protein is shuffled as compared to a wild-type gene encoding said protein;

and wherein the nucleic acid sequence of said wild-type gene has at least 80 percent identity with a nucleic acid sequence selected from the group consisting of SEQ ID NOs: 2 and 18 through 42.

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16. A DNA construct useful for producing the transformed cell or organism of claim 15 comprising at least one of (a) modified sequence of said wild-type gene and (b) a regulatory region operably linked to a said wild-type gene.

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17. A DNA construct of claim 15 wherein the nucleic acid molecule has a sequence which has at least about 85 % homology with SEQ ID NO:2.

18. A method of producing a transformed cell or organism having reduced activity of at least one protein comprising transforming said cell or organism
- 20 with a construct according to claim 9.

19. A method of producing xanthan gum substantially free of galactomannanase activity comprising harvesting xanthan gum from cultured recombinant

Xanthomonas campestris strain having more than one nucleotide base in a *manA* gene deleted.

20. A method of claim 19 wherein substantially all of a *manA* gene is deleted.

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21. A xanthan gum which is essentially free of activity of at least two proteins selected from the group consisting of galactomannanase, amylase, cellulase, extracellular protease, intracellular protease, and glucose dehydrogenase due to recombinant manipulation of genes encoding said proteins, wherein said xanthan gum is harvested from a cultured recombinant *Xanthomonas campestris*.

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